

12/15



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/734,198	12/15/2003	Xintian E. Lin	42339-198341	4797

26694 7590 07/03/2006

VENABLE LLP

P.O. BOX 34385

WASHINGTON, DC 20045-9998

EXAMINER

HAROON, ADEEL

ART UNIT

PAPER NUMBER

2618

DATE MAILED: 07/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/734,198	Applicant(s) LIN ET AL.	
	Examiner Adeel Haroon	Art Unit 2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to Amendment filed on date: 5/18/06.

Claims 1-34 are still pending.

Response to Arguments

2. Applicant's arguments filed 5/18/06 have been fully considered but they are not persuasive.

The applicant argues that Lo et al. do not disclose the limitation "said switch further adapted to couple said receiver chains to said plurality of antennas such that each receiver chain is coupled to a different one of said plurality of antennas". The examiner respectfully disagrees. The word "couple" was interpreted as linking the receiver chains to the antennas; therefore, a direct connection between the receiver chains and the plurality of antennas is not needed for anticipation. The switch of Lo et al. links/couples the receiver chains and the plurality of antennas through element number 205 as shown in figure 2. Also, since element 205 is a N-by-N analog beamformer, it has a one to one ratio of inputs to outputs; therefore, each antenna input corresponds to one output to the switch.

The applicant also argues that Yoon does not disclose the limitation of "to compensate for a lack of use of a diversity combining at a second transceiver". The examiner respectfully disagrees. Yoon's invention "relates generally to an antenna diversity technique in a wireless terminal" (Column 1, lines 7-10). Also, as shown in figure 4, Yoon has one transfer rate when receiving a signal utilizing Rx#1 and Rx#2, which is using diversity, in steps 403-405 and another transfer rate when receiving a signal utilizing only Rx#2, which is a lack of use of diversity, in steps 406-408. Therefore, the change of transfer rates according to whether or not diversity is being used results in compensating for the lack of use of diversity.

Consequently, for the reasons stated above all rejections from the previous Office Action, mailed 4/19/06, are maintained.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Art Unit: 2618

4. Claims 1-5, 7, 10-15, 17, 19, 20, 21, 23 25, 26, 27, and 29 are rejected under 35 U.S.C. 102(e) as being anticipated by Lo et al. (U.S. 6,987,958).

With respect to claim 1, Lo et al. disclose an apparatus in figure 2 with a switch, element number 210, adapted to couple each of at least two receiver chains, element numbers 215 and 220, to one of at least two of a plurality of antennas, element number 201 (Column 3, lines 7-17). Lo et al. teach that the switch is further adapted to couple said receiver chains to said plurality of antennas such that each receiver chain is coupled to a different one of said plurality of antennas, with the switch comprising at least two sub-switches as shown in figure 3, each sub-switch adapted to be coupled to a different one of said at least two receiver chains (Column 3, lines 18-51).

With respect to claim 2, Lo et al. disclose the switch works according to a predetermined criterion as controlled by the digital signal processor (Column 3, lines 18-40).

With respect to claim 3, Lo et al. disclose combining the outputs of the receiver chains (Column 3, lines 26-31).

With respect to claims 4, 5, and 7, Lo et al. show in figure 3, that the sub-switches are coupled to all of the plurality of antennas (Column 3, lines 41-51).

With respect to claim 10, Lo et al. further disclose a sub switch coupled to a transceiver, element number 215, that includes a power amplifier in the transmitter chain and also includes a receiver chain (Column 4, lines 12-23).

With respect to claim 11, Lo et al. disclose a system in figure 2 with a plurality of antennas, element number 201, and at least two receiver chains, element numbers 215 and 220 (Column 3, lines 7-17). Lo et al. disclose an apparatus in figure 2 with a switch, element number 210, adapted to couple each of at least two receiver chains, element numbers 215 and 220, to one of at least two of a plurality of antennas, element number 201 (Column 3, lines 7-17). Lo et al. teach that the switch is further adapted to couple said receiver chains to said plurality of antennas such that each receiver chain is coupled to a different one of said plurality of antennas, with the switch comprising at least two sub-switches as shown in figure 3, each sub-switch adapted to be coupled to a different one of said at least two receiver chains (Column 3, lines 18-51).

With respect to claim 12, Lo et al. disclose a combiner, element number 230, to combine the outputs of the receiver chains (Column 3, lines 26-31).

With respect to claim 13, Lo et al. disclose a demodulator, element number 240, to receive the combined signal and demodulate the combined signal (Column 3, lines 31-34).

With respect to claim 14, Lo et al. disclose the switch works according to a predetermined criterion as controlled by the digital signal processor (Column 3, lines 18-40).

With respect to claim 15, Lo et al. show in figure 3, that the sub-switches are coupled to all of the plurality of antennas (Column 3, lines 41-51).

With respect to claim 17, Lo et al. further disclose a sub switch coupled to a transceiver, element number 215, that includes a power amplifier in the transmitter chain and also includes a receiver chain (Column 4, lines 12-23).

With respect to claims 19 and 25, Lo et al. disclose a method that can be executed by a machine readable medium that determines a subset of antennas out of a plurality of antennas, using a predetermined criterion and switching signals from said subset of antennas to a corresponding number of receiver chains, each receiver chain receiving a different one of said signals from said subset of best antennas, wherein each receiver chain may only receive signals from a predetermined subset of said plurality of antennas (Column 3, lines 7-40).

With respect to claims 20 and 21, Lo et al. disclose combining the outputs of the receiver chains (Column 3, lines 26-31).

With respect to claims 21 and 27, Lo et al. show in figure 3, that each receiver chain may receive signals from any one of the plurality of antennas (Column 3, lines 41-51).

With respect to claims 23 and 29, Lo et al. disclose switching a transmit power amplifier to be connected to any one of the plurality of antennas (Column 4, lines 12-23).

5. Claims 31 and 33 are rejected under 35 U.S.C. 102(e) as being anticipated by Yoon (U.S. 6,987,956).

With respect to claims 31 and 33, Yoon disclose a method that can be executed by a machine readable medium that adjusts the data rate of a first transceiver with a diversity scheme from a high transfer rate to a low transfer to communicate with a transceiver with a lack of antenna diversity as shown in table 2 (Column 3, lines 23-51).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 6, 22, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lo et al. (U.S. 6,987,958) in view of Evans et al. (U.S. 2003/0083016 as provided by applicant).

With respect to claim 6, the apparatus of Lo et al. is described above in the discussion of claim 4. Lo et al. do not disclose that one sub-switch being adapted to be coupled to all except one of the plurality of antennas. However, Evans et al. disclose a switch system controlling diversity system thus making it analogous art since it is in the same field of endeavor. Evans et al. disclose a sub switch, which is coupled to all the plurality of antennas except one in figure 1 (Paragraph 16). Therefore, it would be

Art Unit: 2618

obvious to one of ordinary skill in the art at the time of the applicant's invention to apply Evans et al.'s selective sub switch technique to the apparatus of Lo et al. in order to provide the choice of the antenna with the best isolation.

With respect to claims 22 and 28, the method of Lo et al. is described above in the discussion of claims 19 and 25. Lo et al. do not disclose that one sub-switch being adapted to be coupled to all except one of the plurality of antennas. However, Evans et al. disclose a switch system controlling diversity system thus making it analogous art since it is in the same field of endeavor. Evans et al. disclose a sub switch, which is coupled to all the plurality of antennas except one in figure 1 (Paragraph 16).

Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to apply Evans et al.'s selective sub switch technique to the method of Lo et al. in order to provide the choice of the antenna with the best isolation.

8. Claims 8, 9, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lo et al. (U.S. 6,987,958) in view of Nakamura (U.S. 6,243,563).

With respect to claim 8, the apparatus of Lo et al. is described above in the discussion of claim 1. Lo et al. further disclose a transceiver, element number 215, that includes a power amplifier in the transmitter chain and also includes a receiver chain (Column 4, lines 12-23). There must be some element separating the transmitter and receiver chains, but Lo et al. do not specifically disclose a second switch. However, Nakamura disclose an apparatus with a plurality of antennas and a switch, element

number 4, to separate the transmitter and receiver chain (Column 4, lines 17-35).

Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to include Nakamura's second switch in the apparatus of Lo et al. in order to provide a separator for the transmitter and receiver chains in the transceiver element.

With respect to claim 9, Lo et al. show in figure 3, that the sub-switches are coupled to all of the plurality of antennas (Column 3, lines 41-51).

With respect to claim 16, the system of Lo et al. is described above in the discussion of claim 11. Lo et al. further disclose a transceiver, element number 215, that includes a power amplifier in the transmitter chain and also includes a receiver chain (Column 4, lines 12-23). There must be some element separating the transmitter and receiver chains, but Lo et al. do not specifically disclose a second switch. However, Nakamura disclose an apparatus with a plurality of antennas and a switch, element number 4, to separate the transmitter and receiver chain (Column 4, lines 17-35). Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to include Nakamura's second switch in the system of Lo et al. in order to provide a separator for the transmitter and receiver chains in the transceiver element.

9. Claims 18, 24, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lo et al. (U.S. 6,987,958) in view of Yoon (U.S. 6,987,956).

With respect to claim 18, the system of Lo et al. is described above in the discussion of claim 11. Lo et al. disclose a first transceiver with a plurality of antennas, at least two receiver chains, and a switch (Column 3, line 7-40). Lo et al. do not expressly disclose the second transceiver that the first transceiver is communicating with and changing the data rate. However, Yoon disclose a transceiver with a diversity scheme that changes its transfer rate from a high transfer rate to a low transfer rate to communicate with a transceiver with a lack of antenna diversity as shown in table 2 (Column 3, lines 23-51). Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to apply Yoon's transfer rate controlling technique to the system of Lo et al. in order to adapt transfer rates according to different circumstances.

With respect to claims 24 and 30, the method of Lo et al. is described above in the discussion of claims 23 and 29. Lo et al. do not disclose adjusting the data rate. However, Yoon teaches adjusting the data rate of a signal transmitted thus compensating for a lack of diversity as shown in table 2 (Column 3, lines 23-51). Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to apply Yoon's transfer rate controlling technique to the method of Lo et al. in order to adapt transfer rates according to different circumstances.

10. Claims 32 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoon (U.S. 6,987,956) in view of Tsien et al. (U.S. 2003/0166394).

With respect to claims 32 and 34, the method of Yoon is described above in the discussion of claims 31 and 33. Yoon does not expressly disclose using signal-to-noise ratio to determine an appropriate data rate. However, Tsien et al. teach determining a signal-to-noise ratio to set an appropriate transmit data rate (Paragraph 24). Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to apply Tsien et al.'s technique of using signal-to-noise ration in the method of Yoon in order to achieve an optimum transmit data rate.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adeel Haroon whose telephone number is (571) 272-

Art Unit: 2618

7405. The examiner can normally be reached on Monday thru Friday, 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nay Maung can be reached on (571) 272-7882. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AH
6/19/06



6-25-2006

NGUYEN T. VO
PRIMARY EXAMINER